

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of)
)
Application of BellSouth Corporation,)
BellSouth Telecommunications, Inc.)
and BellSouth Long Distance, Inc.)
for Provision of In-Region, InterLATA)
Services in Louisiana)

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

CC Docket No. 97-231

Comments of MCI Telecommunications Corporation

Exhibits J - L

EXHIBITS

TAB	Title
J	"The Enduring Local Bottleneck," Hatfield Associates, Inc. (Apr. 30, 1997)
K	LCUG and MCI Service Quality Measurements
L	Florida PSC Order, Docket No. 960786-TL (Nov. 19, 1997)

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**Exhibit J:
“The Enduring Local Bottleneck”
Prepared for MCI by Hatfield Associates, Inc.**

THE ENDURING LOCAL BOTTLENECK II

Prepared for MCI

by

Hatfield Associates, Inc.

April 30, 1997

Executive Summary

The *Telecommunications Act of 1996* facilitates the introduction of local competition in several critical ways. However, even assuming successful implementation of the terms of the *Act* by the Federal Communications Commission and the states, competition will develop only if technology and economics make it feasible. Even if technically and economically feasible, the achievement of competition may take a substantial period of time.

This paper conducts an empirical assessment of the prospect that cable telephony and wireless technology will provide significant competition for Incumbent Local Exchange Carrier ("ILEC") residential services. At the time the *Act* was passed, these two technologies were widely believed to be in the best position to compete. Separate business cases for cable telephony and wireless local loop are constructed and analyzed.

The cable telephony analysis assumes that cable networks are already "fiber rich" or Hybrid Fiber Coax ("HFC"). In the case of fiber rich systems a small amount of investment is required to make the system into an HFC platform capable of supporting telephony. An HFC system is capable of supporting telephony with the addition of customer interface units, host digital terminals and additional power. There are substantial costs involved in converting older generation cable systems to fiber rich systems. These are considered to be video service costs. In other words, cable telephony is treated as an incremental service.

The wireless local loop business case assumes that PCS providers use a High Tier CDMA technology. PCS is selected as the preferred platform because the recent auction winners hold unencumbered spectrum and have a "greenfield" business opportunity. Most of the PCS auction winners have announced that they will use CDMA technology. Wireless local loop

service is assumed to be an add-on to mobility service. This means that most of the cost of building a wireless local loop infrastructure is incremental to mobility services.

The recently announced AT&T system may provide a promising alternative to the technology modeled here. However, that technology is, for practical purposes, still on the drawing board. While the ultimate result may be different, at best, alternative technologies such as that under development by AT&T occupy the same ground as did cable telephony some three or four years ago. It would be a mistake to base public policy decisions regarding local telephone company regulation on such a promise.

Both business cases assume that revenues will be derived from a variety of services, including access and resold long distance. Alternative market penetration and long distance demand assumptions are considered. A key assumption made here is that the prices for the incumbent monopoly telephone services move to cost over time. Potential entrants sinking large amounts of capital into local telephone facilities will make their plans based on the economic costs, rather than the current inflated rates of the telephone companies.

As in the original *Enduring Local Bottleneck* ("ELB I") released in 1994, the findings are that the competitive technologies are technologically viable. However, profitability is far in the future and internal rates of return are relatively low, except in the most optimistic cases. As a result, competition is likely to develop slowly, beginning with the more attractive markets. Residential competition may never become ubiquitous. The conclusion is that regulators cannot assume that widespread facilities-based competition is likely in the near term.

The implications for public policy are significant. Given the already weak case for local residential competition, it is essential that pro-competitive public policy measures are

implemented as soon as possible and are vigorously enforced. Policies premised on the inevitability of local competition are destined to fail. Allowing BOCs to enter the long distance market or deregulating ILEC prices would be premature until significant local competition develops.

At the time *ELB I* was published, the results were in conflict with the optimistic press releases and newspaper reports regarding local competition. As this is written, the press reports about local competition are extremely negative. The correct conclusion is likely somewhere in the middle. Significant local competition may well develop, but pro-competitive public policy, as well as a substantial amount of time, are necessary.

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ENDURING LOCAL BOTTLENECK II

I. INTRODUCTION

The Telecommunications Act of 1996 ("*1996 Act*") promotes local competition by reducing state entry barriers and by requiring interconnection, unbundling and resale.¹ Whether or when local markets actually do become effectively competitive is a function of several factors. First, technology and economics must be consistent with a competitive market structure. Second, the interconnection, unbundling and resale provisions of the *1996 Act* must be *implemented* in ways that maximize competitive opportunities.² Finally, and related to the second point, the incentive and opportunity for Incumbent Local Exchange Carriers ("ILECs") to reduce competition through discrimination and anticompetitive pricing must be minimized.

Technology has eliminated, at least to some degree, the natural monopoly characteristics that have prevailed through the history of local telephony. This is especially true for larger business customers. However, even if the *1996 Act* is implemented successfully and anticompetitive behavior eliminated entirely, it may be many years before competitors have an

¹ Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, *to be codified at* 47 U.S.C. paras. 151 *et seq.* There are additional possible barriers to entry from local governments. See Bryan Gruley, "Detroit Suburb Sparks Fight by Levying Fees on Telecom Concerns," The Wall Street Journal (December 23, 1996), p. A1, and letter from Thomas E. Wheeler, President, Cellular Telecommunications Industry Association, to Michele C. Farquhar, Chief, Wireless Bureau, Federal Communications Commission (January 3, 1997), discussing "abusive activities by state and local governments which are thwarting the build out of a national wireless telecommunications infrastructure."

² This includes the requirement that all ILEC systems necessary for interconnection and unbundling are in place, tested and operating. Even with these changes, there will be additional barriers to entry because competitive local exchange carriers ("CLECs") will have to incur substantial sunk costs to build networks and attract customers.

opportunity to develop sufficiently to constrain the market power of the incumbents.³ The primary focus of this paper is on the potential for full facilities-based local competition for residential customers. As long as the approximately 100 million telephone lines serving residential customers remain firmly in the control of the incumbent local telephone companies, the local telephone market cannot be fairly categorized as competitive.

The original *Enduring Local Bottleneck* ("ELB I"), which was completed before passage of the 1996 Act, addressed the feasibility of local competition developing from three alternative sources: cable telephony, wireless local loops ("WLL") and competitive access providers ("CAPs").⁴ ELB I concluded that the cost per connection is too high for the technology employed by CAPs to be a competitive alternative for any but the largest business customers.

As for cable and wireless alternatives to local telephone company services, ELB I found that:

While under certain scenarios the provision of alternative local services will be profitable and yield a positive net present value, they will take 5 to 8 years to generate a positive cash flow and 11 to 15 years to break even. The ultimate profitability of the new entrant is subject to a significant degree of risk.⁵

³ Technology eliminated natural monopoly conditions in the long distance business decades before the market actually became sufficiently competitive to allow substantial deregulation. In 1975, Leonard Waverman demonstrated that scale economies in point-to-point microwave are exhausted at relatively low levels of demand. See "The Regulation of Intercity Telecommunications," in Almarin Phillips, ed., Promoting Competition in Regulated Markets (1975). AT&T was not declared non-dominant in significant portions of the interexchange market until 1995. See In the Matter of AT&T Corp. Petition to be Reclassified as a Non-Dominant Carrier, 11 FCC Rcd. 3271, released October 23, 1995.

⁴ Economics and Technology, Inc./Hatfield Associates, Inc., The Enduring Local Bottleneck: Monopoly Power and the Local Exchange Carriers (1994).

⁵ *Id.*, p. xix.

In January 1996 Hatfield Associates, Inc. ("HAI") provided a qualitative assessment of technological and market changes since publication of *ELB I*, concluding that

there have been no cost breakthroughs in the technologies available to competitors that would suggest the investment results found in *ELB I* will substantially change. Nor have any hypothetical 'volume production' cost reductions materialized, because these technologies are not yet in mass production.⁶

This Report updates the modeling results for cable and wireless technologies performed in *ELB I*.⁷

This updated analysis finds that entry by cable and wireless operators into local exchange markets remains technologically viable, but highly risky. Under a best case scenario, cable companies deploying residential telephony show a positive cumulative cash flow after seven years. Wireless alternatives fare no better. Initial positive cumulative cash flows also come after seven years, but internal rates of return are lower than in the cable case. In both cases, the 10-year internal rate of return is small compared to the risk involved.

The long lag between entry and profitability and the low expected rates of return suggest that the necessary investment for widespread deployment of these technologies is likely to materialize slowly. Neither cable nor wireless operators are likely to engage in widespread deployment of the competitive technologies. Individual markets will be targeted with further

⁶ See The Enduring Local Bottleneck II: A Preliminary Assessment (January 9, 1996), ("*ELB II Qualitative Assessment*"), p. ii.

⁷ Electric utilities are also potential local telephone market entrants. However, the business case for these utilities is likely to be, at best, comparable to the cable telephony business case. Cable companies already have feeder and distribution facilities carrying video communications. Electric Utilities would have to build complete overlay networks.

deployment initiated only after the technology proves in and demand is established. Ubiquitous local competition for residential customers may never materialize.⁸

As noted earlier, the modeling emphasis of this paper is on cable telephony and wireless alternatives for residential customers. However, the brief update of the progress of the CAPs provided below shows that the market for larger business users can by no means be described as competitive. CAPs are growing rapidly, but the base is small and geographically limited while the market is large.

Three key policy conclusions flow from the finding that the development of full facilities-based local competition is not automatic. First, successful implementation of the unbundling and interconnection provisions of the *1996 Act* is critical. These provisions are designed both to limit discrimination and to allow new entrants to have access to the economies of scale, density and connectivity in the ILEC networks.⁹ Absent effective implementation of these provisions, competition is even less likely to develop. Second, any deregulation of ILEC pricing cannot be premised on an assumption that competition is just around the corner. The ILECs will retain substantial market power and have the incentive to exercise it for many years. Third, given that ILECs will retain bottleneck control over large portions of the local exchange

⁸ AT&T has announced a new fixed wireless technology that has great promise. See John J. Keller, "AT&T Unveils New Wireless System Linking Home Phones to Its Network," Wall Street Journal, February 26, 1997, p. B3. As discussed below in Section VII D, the technology is not yet ready for wide scale deployment, and there are a number of technological and operational issues that must be resolved.

⁹ See, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, CC Docket No. 96-98, First Report and Order, 11 FCC Rcd 15499 (1996) ("*Local Competition Order*"), para. 11.

into the foreseeable future, there is a substantial risk of discrimination if the RBOCs are granted premature authority to enter interLATA markets.

The remainder of this paper is organized as follows. Section II discusses market definition issues and describes the services being modeled. Section III provides a brief discussion of the competition concept. Section IV summarizes the current state of competition in local telephone markets. Section V provides an overview of the modeling effort that is the primary focus of this paper. Section VI summarizes the modeling results and qualitative considerations for the cable telephony case. Section VII does the same for wireless local loops. The conclusions are summarized in Section VIII.

II. MARKET DEFINITION

The local exchange telephone business consists of separate geographic markets for local calling and for local access within exchange area boundaries.¹⁰ Local access is defined as the origination and termination of calls to and from interexchange carrier networks. The local exchange business can also be usefully divided into business and residential segments. Business and residential customers have different demand characteristics. In particular, businesses often require high-capacity connections for data or to provide PBX trunks. These demand characteristics have implications for the supply side of the market. Some competing technologies may not have the capability of providing the high-capacity connections needed by businesses for data or PBX trunks.

¹⁰ Both *ELB I* and the *ELB II Qualitative Assessment* provide extensive discussions of local telecommunications markets.

For purposes of the analysis to follow, a competitive local service must provide the following to residential customers:

- Single line, single party service allowing subscribers to place and receive telephone calls (POTS); this includes interconnection to other ILECs in the market;
- All complementary and ancillary services provided by the ILEC, including operator assistance, directory assistance, emergency (911) service, telecommunications relay service (TRS), custom calling services such as call-forwarding, Caller ID, etc., and enhanced services such as voice mail;
- The same service quality and reliability as the ILEC;
- The ability to use all of the subscriber's existing customer premises equipment (telephones, fax machines, modems);
- Number portability, and
- A competitive price.

It is also necessary to distinguish between retail and wholesale competition. The *1996 Act* provides for retail competition through two alternative mechanisms. First, retail competitors are allowed to purchase unbundled network elements ("UNEs") at economic cost from the ILEC. So, for example, a firm that can self-provision its own loops may purchase switching from the ILEC in order to provide retail services to customers. Second, retail competitors are allowed to purchase services from the ILEC at wholesale rates that reflect the avoided costs of the ILEC retailing operation.

This study focuses on full facilities-based competition rather than retail competition. Retail competition can obviously provide consumer benefits and facilitate facilities-based competition at the wholesale level. However, in both the UNE and the resale competition cases, the retail competitor is dependent on bottleneck supply of essential inputs by the ILEC. Only

when effective competitive alternatives exist for wholesale facilities such as loops will this dependence, and the consequent need for consumer and competitive safeguards, end.

III. DEFINING COMPETITION

The popular and business press often confuse the concepts of competition and deregulation. The term “deregulation” is often used to refer both to the process of opening entry into a market and to the process of reducing controls over pricing and profits. Unless barriers to entry are low, the first (and maybe only) thing that opening entry does is to change a market from a *de jure* to a *de facto* monopoly. A market becomes competitive only when competitors actually enter and a significant proportion of consumers have an actual choice of suppliers. Deregulation of prices and profits prior to the development of effective competition may actually reduce competitive opportunities. Table I lists various points on the continuum between monopoly and competition.

The industrial organization literature provides a way to measure the extent of competition quantitatively. The Lerner Index defines market power as the difference between marginal cost and the profit maximizing price an unregulated dominant firm would charge. The profit maximizing price depends on the market share of the dominant firm, the supply elasticity of the fringe competitors, and the market elasticity of demand.¹¹ ILECs start with market shares that

¹¹ See David L. Kaserman and John W. Mayo, Government and Business: The Economics of Antitrust and Regulation (1995), pp. 104-109, for a discussion of the relationship among market power, market share, entry barriers and demand elasticity.

TABLE I

Significant Points on the Continuum between Monopoly and Competition	
De Jure Monopoly	This was the case in local markets in many states prior to passage of the <i>1996 Act</i>
Entry is allowed	Full entry is now allowed
Non-legal barriers to entry have been reduced	Requires full implementation of the <i>1996 Act</i>
Actual entry has occurred	There is very little actual entry for switched local services
A high proportion of customers has a choice of suppliers and a significant number of them have exercised this choice	Not true in any local market
Textbook Competition -- each firm has a small portion of the market	Not likely in the foreseeable future

approach 100 percent. Although legal entry barriers have been addressed, substantial economic barriers to entry into local telephone markets remain. Demand for local services is highly inelastic. Therefore, based on this approach to measurement of market power, the current market situation can only be characterized as highly monopolistic. Section IV discusses additional empirical measures of the extent of market power in the local telephone market.

IV. CURRENT COMPETITION

The *ELB II Qualitative Assessment* documented the state of competition as of the beginning of 1996, and contrasted it with the situation described in *ELB I*. The conclusion at that time was that local exchange competition was taking place mainly in the form of dueling

press releases describing investment *plans*. Little has changed in the market since then. What has changed is that now even the press accounts recognize the substantial barriers to implementing competition.¹²

The *ELB II Qualitative Analysis* demonstrated the lack of competition by analyzing local exchange market structure, conduct, and performance. An update of the evidence in all three categories shows that the ILEC monopoly is still intact.

A. Structure

As was the case a year ago, there is no local market where competitors have obtained a significant share of the local exchange business. Local exchange competition has typically taken the form of “trials” serving limited numbers of subscribers. A handful of actual commercial start-ups has recently been reported in the trade press.¹³

Local access competition is taking place in the central business districts of large cities. The CAP share of the business has grown substantially in percentage terms. However, the CAPs start with such a small base that their total market position is not yet significant.¹⁴

¹² See, e.g., David Lieberman, “Small Step to Riches Has Become Costly Leap of Faith,” USA Today (October 14, 1996), p. 1A.

¹³ See, e.g., Vince Vittore, “TCI Dials Up Telephony in Ill.,” Cable World, (January 20, 1997), p. 1. Experience in Rochester was discussed in the *ELB II Qualitative Analysis, supra.*, note 6, p. 10.

¹⁴ At the time *ELB I* was completed in 1994, MCI reported that less than one percent of its access expenses were paid to CAPs. That number has now approximately doubled (including purchases from MCI Metro). Even if this rapid rate of growth can be sustained, it will take some time before the CAPS attain a significant market share.

At the beginning of 1996, with few exceptions, CAPs were providing exchange access only. Prior to passage of the 1996 Act, some CAPs had negotiated interconnection agreements, which allowed them to provide local switched traffic. The number of agreements has increased and will increase dramatically as arbitrations under the Act are completed.

This means that the number of businesses that have access to an alternative supplier of service is growing. The key point to remember about CAPs, however, is that they do not serve cities or even neighborhoods within cities. They serve individual buildings. The process of making the local market competitive building by building will take a long time. It is often difficult and expensive to add a building to a CAP fiber route even if the building is located nearby.¹⁵ There are an estimated 4.6 million commercial buildings in the U.S.¹⁶ The three largest CAPs serve a total of 5,650 buildings with their own facilities.¹⁷ Nevertheless, with successful implementation of the unbundling and interconnection provisions of the *1996 Act*, the number of large businesses with competitive alternatives will likely continue to grow. However, even with loop unbundling at economic cost, the CAPs remain at the mercy of the ILEC for provisioning and maintenance, and at the mercy of continued regulatory oversight to ensure efficient pricing of interconnection and unbundled network elements.

¹⁵ See "Testimony of Robert A. Mercer on Behalf of AT&T Communications of Illinois," Illinois Commerce Commission, Docket No. 94-0048 (August 8, 1994).

¹⁶ U.S. Energy Information Administration, Commercial Building Characteristics, www.eia.doe.gov (1995). The number of office buildings is 712,000.

¹⁷ See Merrill Lynch, Teleport Communications Group (November 13, 1996), p. 2 (Teleport and MFS have, respectively, 2,800 and 2,500 directly connected buildings) and Goldman, Sachs & Co., et al, Hyperion Telecommunications, Inc. Prospectus (October 11, 1996), p. 24 (1,101 directly connected buildings).

A limited number of states required loop unbundling prior to the passage of the *1996 Act*. There has been substantial growth in the number of unbundled loops measured in percentage terms because the CAPs started out with a base of zero. Overall market impact is still not substantial. For example, Robert G. Harris and David J. Teece report that CAPs in Michigan had procured 15,162 unbundled loops from Ameritech by November 1996, up from only 918 in September 1995 -- an impressive rate of growth.¹⁸ However, as of December 31, 1995, there were almost 6.2 million switched and special access lines in Michigan.¹⁹ This means that substantially less than one half of one percent of all provisioned loops were sold on an unbundled basis. Ameritech provided 5.5 million of these lines.²⁰ Merrill Lynch points out that the success of Brooks Fiber in Grand Rapids, Michigan may be due in part to the fact that Ameritech is a "willing accomplice . . . who we think would gladly trade share loss in Grand Rapids for long distance authority in Michigan, and thus has been more willing to rapidly provision unbundled loops to Brooks' than other ILECs in other markets have proven to be."²¹

B. Conduct

If the ILECs truly feared the entry of full facilities-based competitors, they would have an economic incentive to sell unbundled network elements in order to retain as much business as possible. In many cases, the ILECs failed to reach voluntary agreements to sell facilities to

¹⁸ See Joint Affidavit on Behalf of Ameritech Michigan, In the Matter of Application of Ameritech Michigan Pursuant to Section 271 of the Telecommunication Act of 1996 to Provide In-Region, InterLATA Services in Michigan (December 23, 1996), p. 25.

¹⁹ See FCC, Statistics of Common Carriers (1995/1996 Edition), p. 23.

²⁰ *Id.*, p. 150.

²¹ See Merrill Lynch, Brooks Fiber Properties, Inc. (January 6, 1997), p. 15.

companies seeking to enter the local exchange business. Most of the voluntary agreements were reached with CAPs, whose markets are narrow. Companies like AT&T and MCI, which are seeking to enter the market more broadly using resale or unbundled network elements, have had substantial difficulty negotiating voluntary interconnection agreements. Therefore, state regulators are forced to arbitrate interconnection terms and conditions.

C. Performance

The pricing and profit performance of the ILECs demonstrates their market power. Profits continue to rise, while prices continue to hover close to the Federal Communications Commission's ("FCC's") price caps. Despite high prices and rising profits, ILEC switched access minutes continue to grow.

1. Profits

As Table II shows, RBOC returns on equity has grown each year since 1991. RBOC returns on equity have exceeded the return for the S&P 500 and have risen despite the downward trend in interest rates.²²

²² Also see Mark N. Cooper, Excess Profits and the Impact of Competition on the Baby Bells (September 1996).

TABLE II

RBOC Profit Performance - Return on Equity					
Year	1991	1992	1993	1994	1995
RBOC Total	13.1%	14.7%	16.6%	16.9%	19.7%
10-Year Treasury Note	7.7%	7.0%	5.9%	7.1%	6.8%
S&P 500	8.8%	10.7%	12.2%	15.9%	16.4%

Source: Company Annual Reports, excluding effects of accounting changes and one-time charges.

2. Pricing

Competition has not constrained ILEC prices. As the following Table shows, interstate switched access and trunking prices remain close to the FCC prescribed maximums. The Price Cap Index ("PCI") is the maximum allowed by the FCC's price cap rules, while the Actual Price Index ("API") reflects actual ILEC pricing. The Hatfield Model shows that current access prices are well above economic costs.²³ Therefore, these numbers show that regulation, and not the market, is constraining ILEC prices.²⁴

A similar story is told by the use of pricing flexibility already granted to the ILECs by the FCC. The FCC's price cap rules also permit density zone and volume discount pricing for services allegedly subject to competition. However, in many cases this authority has not been exercised, suggesting the lack of a pervasive competitive threat.²⁵

²³ See Hatfield Model, Version 2.2, Release 2 (September 4, 1996).

²⁴ These results are similar to previous years. See, Affidavit of A. Daniel Kelley, U.S. v. Western Electric Company, Inc. and American Telephone and Telegraph Company, C.A. No. 82-0192 (December 1, 1994), p.18.

²⁵ See Comments of MCI, Access Charge Reform, CC Docket No. 96-262, filed January 29, 1997, pp. 48-52.

TABLE III

RBOC Prices vs. Price Cap Policies			
Company	PCI	API	Difference
Ameritech Traffic Sensitive Trunking	79.9 85.9	79.9 79.0	0.0 6.9
Bell Atlantic Traffic Sensitive Trunking	79.3 80.6	79.3 79.0	0.0 1.6
Bell South Traffic Sensitive Trunking	77.2 81.7	77.1 80.9	0.1 0.8
NYNEX Traffic Sensitive Trunking	81.9 84.7	81.9 84.7	0.0 0.0
Pacific Bell Traffic Sensitive Trunking	90.3 77.5	90.3 77.5	0.0 0.0
Southwestern Bell Traffic Sensitive Trunking	78.8 83.2	78.6 82.0	0.2 1.2
US West Traffic Sensitive Trunking	78.6 83.1	78.6 81.8	0.0 1.3

Source: 1996 Annual Access Tariff Filings, Price Cap Tariff Review Plan, and subsequent tariff transmittals.

3. Minute Growth

The high prices and profits discussed above have not led to a reduction in the sales of access services by the ILECs, which is a result that could be expected in a market with developing competition. As the next Table shows, quarter over quarter growth in ILEC access minutes remains strong. The ILECs have argued that CAPs are already having a substantial

impact on their business by building facilities to large business customers. However, these access minute growth numbers show that the CAPs are certainly not reducing ILEC switched minute sales. Data provided by interexchange carriers confirm that CAPs are not taking a substantial portion of the access market. As noted above, in 1996 MCI spent a total of approximately two percent of its total access expenses on CAP provided access.

TABLE IV

ILEC Switched Access Minutes Growth		
September to September	Minutes (billions)	Percent Change
1994	95.9	9.3
1995	102.7	6.7
1996	110.5	9.4

Source: NECA Supplemental Report of Common Line Pool Results as of November, 1996.

V. MODELING

This empirical update focuses on the possibility of near-term competition in the residential segments of the local exchange business from cable television and wireless operators. As was the case in *ELB I*, the end result of the modeling effort is a business case for deploying the new technologies, using assumptions about projected revenues, investments, and operational costs. Some of the major differences between assumptions in *ELB I* and *ELB II* are discussed here. Additional details can be found in the individual business cases.

Since completion of *ELB I*, HAI has been engaged in extensive modeling efforts designed to estimate ILEC costs of providing local services. Much of the learning in that effort

is applicable here. As a result, some of the assumptions in *ELB I* have been changed to reflect the new information. The models used to estimate the viability of competitive alternatives in *ELB I* have also been updated to reflect several technological developments since *ELB I* was published, as well as more recent information on equipment costs. In addition, a more sophisticated expense module is included.

ELB I used a 15-year net present value ("NPV") analysis to assess the potential profitability of the cable and wireless alternatives. The business case considered here uses a 10-year internal rate of return ("IRR") instead. A 10-year period was selected because most investors would require profitability within this period. IRR analysis was selected because the resulting percentage returns provide a more intuitive picture of the financial attractiveness of the investments than do per subscriber net present values.²⁶

The IRR must be compared to a "hurdle" rate. The hurdle rate represents a rate of return that must be met in order for the firm to commit capital to the project. The riskier the project, the higher the hurdle rate will be. As this paper demonstrates, competing with monopoly local telephone companies will be risky. Therefore, the business case analysis assumes an IRR hurdle of 15 percent. This rate is supported by a number of sources in the investment community.²⁷

²⁶ In any event, NPVs are calculated in the business case models, and are negative in all but the most optimistic cases.

²⁷ Merrill Lynch, "Wireless in the United States: The Next Generation," attributes costs of capital ranging from 12 to 16 percent to PCS carriers (March 1996), p. 14. Donaldson, Lufkin & Jenrette, "The Wireless Communications Industry," uses discount rates (equivalent to an IRR hurdle rate) between 12 to 15 percent (Summer 1996), p. 59. Bear Stearns, "Cable A.D. (After Deregulation)," uses a 20 percent discount rate, indicating that is an expected minimum return (April 12, 1995), p. 93.

Law and regulation have obviously changed since the last report. Many of these changes have implications for modeling competing technologies. *ELB I* assumed that the competitive technologies would stand alone in the sense that they would provide all of the facilities between end users and the interconnection point with the existing local exchange. With passage of the 1996 Act, and assuming successful implementation, hybrid approaches will be possible. Competitors will have the option of using ILEC unbundled network elements instead of their own facilities to perform various functions. Resale of retail services purchased from ILECs at wholesale rates is another transitional strategy that would allow competitors to acquire customers in advance of building facilities.

As noted above, CLECs using UNEs or resale are still at the mercy of the monopoly supplier for provisioning and maintenance of the monopoly services. These CLECs will also depend on regulators for reasonable pricing of ILEC facilities and services. Full competition requires that competitors have as much independence as possible from monopoly supplied network elements. The essence of cable telephony and wireless local loops is the ability to provide a substitute for ILEC loops. Therefore, in the context of this modeling effort, it would make no sense to substitute loops purchased as UNEs for cable or wireless operator loops. However, in the following analysis, it is assumed that switching can either be self-provisioned or purchased at the forward-looking costs estimated in the Hatfield Model.